

Appendix A

Anheuser-Busch, Inc

Pilot Study Report

California Environmental Protection Agency
Environmental Management System Project

1.0 Project Description

Anheuser-Busch, Incorporated (A-BI) is a brewer of malt beverages. A-BI and its parent company, Anheuser-Busch Companies employ more than 24,000 employees in the United States and overseas and are headquartered in St. Louis, Missouri. Operations at A-BI's Fairfield, California facility include brewing, packaging, and distributing beer. The Fairfield facility has approximately 500 employees.

Pilot Project Management

A-BI was selected as a pilot in June 2000. The Cal/EPA Project Manager is Richard Corey, Chief, Research and Economic Studies Branch, Research Division, Air Resources Board. Mr. Corey was assisted by Jean Woeckener, Air Pollution Specialist, Stationary Source Division, Air Resources Board.

For the purpose of this Project, the main contact has been Jack Stein, Director, Strategic Environmental Initiatives, Anheuser-Busch Companies, St. Louis, MO. Data and assistance was also provided by John DeSelm, Director, Environmental Assurance, Anheuser-Busch, Inc., St. Louis, MO. and Robert Wachter, Environmental Health and Safety Resident Manager, Anheuser-Busch, Inc., Fairfield, CA.

History of Environmental Management at A-BI

A-BI has a long history as a leader in promoting environmental health, and safety. As far back as 1899, the first Anheuser-Busch recycling program reused spent brewers grain as cattle feed.

In 1960, A-BI instituted Corporate Safety Audits in which corporate staff visited each facility, then provided facility management with an executive report. In the early 1980's, the company established its environmental audit program. This program created teams of corporate environmental staff, on-site environmental staff, and external consultants to conduct audits at each facility.

In 1983, A-BI began developing a Bio-Energy Recovery System. This system's advanced technology converts gases generated from wastewater into energy and reduces the quantity of biological oxygen demand by 85 percent. Also in the early 1980's, A-BI breweries began implementing new equipment designs, technologies, and controls to reduce electricity use in refrigeration systems.

In 1996, A-BI initiated Utility Challenge 2000, a program designed to keep utility costs in the year 2000-01 at or below utility costs in 1995. This program includes water, wastewater, electricity, fuel, and carbon dioxide costs. This program was successful and the company did hold their utility costs at the 1995 level.

In addition to these programs, since the early 1990's, A-BI has participated in the following non-environmental management programs and voluntary environmental management programs: Total Quality Management, International Chamber of Commerce Charter for Sustainable Development, ClimateWise, Wa\$tewi\$e, and the U.S. EPA's 33/50 Program.

For nearly 150 years, A-BI has operated its breweries and subsidiaries with the guiding philosophy that every choice made regarding the earth, air and water around their facilities is made with the objective of preserving it for generations to come. With its history, the move to an integrated environmental, health and safety program was a natural step.

The Fairfield facility began development and implementation of its environmental management system (EMS) as part of A-BI's company-wide initiative in 1992. Since 1992, A-BI progressively enhanced its EMS through a continual improvement process. The Fairfield facility was certified to ISO 14001 in December 1999. Further, the company's historical efforts to align its corporate Environmental Health & Safety (EHS) program with the ISO 14001 Standard provided an opportunity to assess the challenges of bridging from an EHS to a certified EMS. Specifically, the Fairfield facility has provided insight regarding the environmental and economic impacts associated with transitioning from a comprehensive EHS to an EMS that is certified to the ISO 14001 standard.

The brewery in Fairfield is the only A-BI facility that has been certified to the ISO 14001 standard. At this time, there are no plans for other breweries to be certified because ISO 14001 elements have been incorporated into the corporate EHS Management System. The company pursued registration at the Fairfield brewery as a pilot for determining the effectiveness of the standard at its facilities and to test its belief that they could be certified to the ISO 14001 standard with modest adjustments to their EHS. In addition, A-BI wanted to be a role model for other industries as well as test the possibility of regulatory flexibility.

2.0 Project Objectives

The pilot project with A-BI was conducted in order to meet the following objectives specified in AB 1102 (Stats. 1999, Ch. 65) codified in Public Resources Code, Section 71045 et seq.

Objective 1	Whether and how the use of an environmental management system (EMS) by a regulated entity increases public health and environmental protection over their current regulatory requirements ¹ ; and
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¹ Protection provided by current regulatory requirements is defined as those protections provided through the issuance, enforcement, and monitoring of any permit, requirement, authorization, standard, certification, or other approval issued

Objective 2 Whether and how the use of an EMS provides the public greater information on the nature and extent of public health and environmental effects than information provided by their current regulatory requirements².

To the above, the Cal/EPA added the following objectives:

Objective 3 Evaluate economic indicators to determine incentives and barriers to EMS implementation

Objective 4 Identify challenges and successful examples of EMS implementation

Further, each pilot candidate had one or more additional pilot specific objectives. The following were the Pilot specific objectives for A-BI.

Objective 5 Determine if and how A-BI uses progress towards targets to continually reduce adverse environmental impacts

Objective 6 Determine the impact of A-BI's EMS on increasing the awareness and implementation of pollution prevention measures

Objective 7 Determine if A-BI's EMS leads to a reduction in violations/potential violations

Objective 8 Determine if A-BI's EMS leads to greater employee awareness of its impact on the environment as well as the likelihood that they will make adjustments to reduce their impacts

In the following sections, each objective will be paraphrased. For example, Objective 1 is referred to as simply environmental protection. The term environmental protection is intended to capture protection of both environmental and public health.

3.0 Project Methodology

A-BI contributed data consistent with the requirements of the National Database and the California Protocols. A-BI collected all data submitted for this report.

by a federal, state, regional or local agency to the regulated entity for the protection of the public health or the environment (PRC § 71046(a)(1)).

² Information provided by current regulatory requirements is defined as that information provided through the issuance, enforcement, and monitoring of any permit, requirement, authorization, standard, certification, or other approval issued by a federal, state, regional or local agency to the regulated entity for the protection of the public health or the environment, or any other law or regulation governing the disclosure of public information (PRC § 71046(a)(2)).

In addition to the protocols, participants conducted site tours of their facilities for the Cal/EPA team and Working Group members. Facilities also had consultation meetings with team members to elicit specific information about their facility.

The analysis was accomplished by evaluating changes in environmental protection and in the provision of environmental information to the public as a result of EMS implementation at A-BI.

3.1 Objective 1 Environmental Protection

To determine whether and how improved environmental protection resulted from EMS implementation, the following three primary categories of information were evaluated.

1. Awareness and commitment
2. Systematic management of environmental impacts
3. Environmental performance indicators

Awareness and Commitment refers to the scope of environmental issues to which the organization devotes its attention, and identifies increased knowledge and understanding of environmental impacts, as well as recognition that action is necessary to lessen impacts and improve environmental protection.

Staff reviewed and analyzed the following measures of Awareness and Commitment:

1. The presence of an environmental policy which describes the organization's commitments and principles in regards to environmental protection.
2. Demonstrated knowledge and understanding of environmental laws, regulations, and other requirements.
3. Demonstrated knowledge and understanding of the environmental impacts of the organization.
4. Documentation of objectives and targets for environmental protection improvements.

Systematic management of environmental impacts refers to the ability of an organization to better protect the environment through a more mature and effective system of environmental management.

Staff reviewed and analyzed the following measures of systematic management for environmental protection:

1. Documented implementation strategies and responsibilities designed to meet regulatory requirements, manage significant aspects, and achieve objectives and targets for improved environmental protection.
2. Measures to assess environmental performance.

3. Audit and review processes to assess the performance of the management system and make system adjustments in order to continually improve environmental performance and protection.

Environmental performance indicators are the most quantitative and direct way of measuring changes in environmental protection. Key environmental indicators are the direct performance measure of an EMS. Examples include energy use, water use, solid and hazardous waste reduction, air emission, and quality of water discharge. An analysis of key environmental indicators provides information as to whether an EMS improves environmental protection.

Project staff reviewed and analyzed environmental data in the following areas to determine whether the EMS improved environmental protection.

1. Progress towards objectives and targets,
2. Pre and Post EMS Environmental Performance
3. Performance Beyond Regulatory Requirements
4. Compliance Performance

3.2 Objective 2 Environmental Information

Staff analyzed the following two factors to determine whether and how an EMS provides greater environmental information to the public was accomplished.

1. The level of public and stakeholder involvement into the EMS development, implementation, and review; and
2. The level of improvements in the accessibility and quality of environmental information available to the public as a result of EMS implementation.

The level of public and stakeholder involvement into EMS development, implementation and review not only indicates changes in communication, it also indicates a changing stakeholder role in improving environmental protection. Involvement provides avenues for stakeholder response to environmental information and feedback to the organization on their performance. This indicator of greater environmental information is measured by evaluating actual stakeholder participation in the pilot's EMS and processes in the EMS for outside communication. This information was collected through the National Database, California Protocol and through Cal/EPA Project Manager's observations.

Improvements in the accessibility and quality of environmental information were evaluated using the California Protocols. Improvements in compliance with legal reporting requirements and information sharing beyond legal requirements indicate improved communication to the public. Accessibility and quality (timeliness, relevance, completeness, and credibility) is evaluated to determine whether the EMS results in greater information available to the public.

3.3 Objective 3 Economic Incentives and Barriers to EMS Implementation

Economic indicators provide an indication of economic costs and benefits of EMS implementation. Although determining economic impacts of EMS implementation is not a primary objective of the EMS Pilot Project, understanding these impacts is helpful in identifying incentives and barriers to EMS implementation. The economic data is analyzed to determine if the EMS provided savings incentives or increases in the costs of environmental management.

3.4 Objective 4 Successes and Challenges of EMS Implementation

Each pilot project offers unique experiences that provide lessons on the challenges inherent in the successful implementation of an EMS. These lessons help develop an understanding of the necessary or critical elements for successful EMS implementation. Challenges and successes were identified through the Cal/EPA and U.S. EPA Project Managers' observations, interviews with Company personnel and data analysis.

3.5 Objective 5 Determine if and how A-BI uses progress towards targets to continually reduce adverse environmental impacts

An understanding of the importance and effectiveness of objective and target setting in continually reducing adverse environmental impacts will be achieved by evaluating objectives and targets set by A-BI and progress towards those objectives. Further, an understanding of their processes for audits, performance review and corrective action will also provide insight into if and how A-BI's EMS provides for continual improvement in environmental protection.

3.6 Objective 6 Determine the impact on A-BI's EMS on increasing the awareness and implementation of pollution prevention measures

The impact of A-BI's EMS on increasing the awareness and implementation of pollution prevention measures can be understood by analyzing the inclusion of pollution prevention themes in objectives and targets as well as in EMS programs like training and communication.

3.7 Objective 7 Determine if A-BI's EMS leads to reduction in violations/potential violations

Evaluating pre and post EMS compliance at A-BI Fairfield can help determine whether the EMS has had an effect on compliance

3.8 Objective 8 Determine if A-BI's EMS leads to greater employee awareness of their individual impact on the environment, as well as the likelihood that they will make adjustments to reduce their impacts

The effect of A-BI's EMS on employee awareness can be understood through evaluating A-BI's training, communication and employee involvement programs.

4.0 Discussion and Analysis

4.1 Objective 1 Environmental Protection

Awareness and Commitment

Environmental Policy

The A-BI Environmental Health and Safety Policy was developed by the company's EHS Policy Committee, approved by the senior-level Strategy Committee, and issued in 1998 by Anheuser-Busch President and Chairman of the Board, August A. Busch III.

The Anheuser-Busch EHS policy applies globally to all subsidiaries and facilities under the company's operating control. Where the company does not have such control, Anheuser-Busch informs its affiliates of this policy and urges them to adopt comparable policies and practices.

In the EHS policy, the company pledges to its employees to:

- Create a safe and healthy workplace;
- Build a respect for the environment;
- Conform to the spirit as well as the letter of applicable laws and regulations and to the company's EHS requirements;
- Set EHS goals and objectives and measure progress toward them; and
- Integrate EHS considerations into business planning, decision making, and daily activities provide the resources and training to carry out this policy.

To the community, the company pledges to:

- Prevent accidents and minimize environmental impacts; communicate its EHS performance;
- Respond to their neighbors' concerns;
- Support EHS public policy development;
- Support wildlife and habitat conservation efforts; and
- Conserve resources and minimize waste by reducing, reusing, and recycling.

To contractors, suppliers, and customers, the company pledges to:

- Encourage, support, and recognize EHS innovations;
- Assist in the integration of EHS excellence into products and services; and
- Exchange EHS knowledge and technology.

And finally, to the company shareholders, they pledge to increase shareholder value through EHS excellence.

Knowledge and Understanding of Legal Requirements

A-BI uses a Regulatory Information Management System (RIMS) database to keep corporate environmental, governmental, legal and management personnel up-to-date on

environmental legislative issues. Federal, state and local agency regulatory actions are tracked and information is available corporate-wide.

This same database is a tool to help subsidiaries, facilities and corporate departments identify and address environmental, health, and safety (EHS) issues in the early stages of either capital projects or process changes. Completing the EHS review may trigger the involvement of EHS experts needed to determine the correct course of action to prevent adverse environmental, health or safety impacts. It proactively identifies issues that require more information and possible follow-up actions. The tool is used to document both long-term EHS impacts and one-time events such as construction and demolition waste or safety issues that are a concern only during project implementation.

A-BI established their compliance audit program in 1981. Since its inception, the program was particularly geared towards making personnel aware of legal requirements. By virtue of the continuous improvement process used by A-BI, the overall knowledge and understanding of legal requirements was not greatly affected.

Knowledge and Understanding of Environmental Impacts

Table 1 shows Significant Aspects and Impacts for A-BI and whether the aspect relates to regulated or non-regulated impacts. A-BI reported five significant aspects: ammonia refrigeration, boiler operation, mash and cooker operations, brew kettle operations, and bottle lines. All the aspects have regulated air impacts and two, ammonia refrigeration and bottle lines, have regulated health and safety impacts. All the significant aspects also have water, solid waste, energy, material/resource input and natural resources as non-regulated impacts. A-BI includes drinking water, irrigation water, process water, electricity and fuel in "Natural Resources."

Significant aspects were determined by taking all of the Fairfield facility aspects and impacts and rating them within 10 categories. These categories included: severity, scale, probability, duration, regulatory exposure, difficulty of change, effect, complaints/inquiries, public relations and cost of change. All of A-BI's significant aspects are at or below their permitted levels.

Based on our discussions with A-BI, the company has done aspect and impacts analysis for many years. According to A-BI representatives, the EMS process provided a better process to prioritize their environmental aspects and impacts.

Objectives and Targets

Table 2 list Objectives and Targets for A-BI. Because the significant aspects and impacts for A-BI are at or below permitted levels and compliance with applicable rules and regulations is consistently achieved, they have focused their objectives and targets on non-regulated impacts including reduced energy use, reduced water use, reduced solid waste disposal, and reduced hazardous waste disposal.

All of A-BI's targets and objectives are related to non-regulated impacts (i.e. water, solid waste disposal, energy, hazardous waste disposal). Because A-BI reports its data in corporate-wide terms it is not possible to determine if the Fairfield facility is meeting its targets and objectives.

Systematic Management for Environmental Protection

This section describes the actions taken by the organization that relate to the implementation and review phases of the EMS and document how the organization protects the environment through its operations.

Documented Implementation Strategies and Responsibilities

A-BI has implemented the following programs in order to meet regulatory requirements, manage significant aspects and achieve objectives and targets. Each of these programs is discussed below in detail.

- Operational Controls
- Training Programs
- Emergency Preparedness
- Compliance Assurance
- Employee Involvement and Communication
- Pollution and Prevention Programs
- Supply Chain/Environmental Preferred Purchasing
- Performance Tracking
- Audit and Review

Operational Controls

A-BI identifies those operations and activities that are associated with the identified significant environmental aspects consistent with its policy, objectives and targets. The organization plans these activities, including maintenance, in order to ensure that they are carried out under specified conditions by:

- Establishing and maintaining documented procedures to cover situations where their absence could lead to deviations from the environmental policy and the objectives and targets
- Stipulating operating criteria in the procedures
- Establishing and maintaining procedures related to identifiable significant environmental aspects of goods and services used by the organization and communicating relevant procedures and requirements to suppliers and contractors

The EMS registration process provided A-BI with a framework for a formal mechanism for updating its operational procedures.

Training Programs

A-BI conducts environmental training at all operating facilities for all levels of employees. This ongoing training raises environmental awareness through programs that focus on general awareness for all employees, specific topics for facility managers and their staff, new employee orientation and ISO 14001.

The following training classes are provided at A-BI.

- Annual DOT hazardous material training of all employees
- Annual emergency action/fire prevention training
- Annual hazard communication/chemical safety training, biennial radioactive source management
- Triennial asbestos awareness training
- Initial Environmental Health and Safety (EHS) awareness training
- Initial personal EHS risk management training
- Initial EHS leadership training for all supervisors, and Initial wastewater treatment training

Short tests are given at the completion of most training to check for understanding. The training is evaluated by participants at the completion of the program. Some training such as emergency response is evaluated in mock drills.

The training program has been developed to meet compliance requirements, as well as support the EHS management program. The training program has expanded since the EMS was developed to give employees a better understanding of the EHS consequences of not performing their jobs correctly.

Emergency Preparedness

A-BI's Policy states "prevent accidents and minimize environmental impacts." To ensure that this commitment is met one of the requirements of the system is *Incident Response and Preparedness* which states "Environmental, Health & Safety incident response and preparedness programs will address EHS incidents. The program is designed to provide emergency and hazard information to employees and the community to facilitate an effective response to an EHS incident."

Emergency preparedness is integrated into A-BI's EHS strategic plans, programs, procedures, training and awareness, management system reviews, and is audited to ensure it is properly integrated.

A-BI's Emergency preparedness program has evolved over time. The scale used for determining significant aspects at the Fairfield facility (severity, scale, probability, duration, regulatory exposure, difficulty of change, effect, complaints/inquiries, public relations and cost of change) provided focus for the facility in identifying and preparing for effective response to an incident.

Compliance Assurance

Each facility is required to perform annual self-assessments to identify potential and actual non-conformances with laws and internal requirements. Additionally, each facility is provided and maintains an on-line EHS Manual which is designed to provide the facility with all the tools necessary to maintain compliance with the laws and internal requirements.

If a nonconformance with a law or internal requirement is found, an Environmental Issues Status Report is filed and used to address and track timely correction of the nonconformance. A Root Cause Analysis is done to mitigate recurring nonconformance with the law and internal requirements.

Employee Involvement

After EHS Management System implementation, employees began to better understand their roles and responsibilities. Employees also appear to have a better understanding of the EHS consequences of not performing their jobs correctly. Employees also understand they are empowered and have the authority to perform their jobs in the most EHS-friendly way. Anheuser-Busch's EHS Policy states "neither production goals nor financial objectives shall excuse noncompliance with the EHS Policy."

The company shares its progress on all EHS performance metrics, including compliance metrics and environmental impact metrics. Information is shared with employees through newsletters, web pages, AB TV, communication meetings, bulletin boards, electronic message boards and check inserts.

A-BI began its training of employees to be aware of the importance and operation of the environmental management system in 1998 in preparation for its ISO registration.

Pollution Prevention Programs

A-BI has focused on moving its pollution prevention efforts from a reactive to a proactive strategy. Pollution prevention is centered on reduction and reuse, and has been expanded to utility companies providing service to the brewery. Prior to implementation of the EHS Management System, A-BI's pollution prevention techniques could be considered end-of-pipe technology. Pollution prevention primarily focused on recycling activities.

Supply Chain/Environmentally Preferred Purchasing

All of A-BI's suppliers receive a Supplier Guide, which encourages suppliers to provide products and services and use production processes consistent with A-BI's EHS policies and internal requirements.

In addition, Corporate Purchasing has integrated an environmental standard into its Potential Supplier Evaluation process and Supplier Certification Program for packaging suppliers. Therefore, environmental concerns are part of purchasing decisions. The environmental standard takes a management system approach, seeking information about suppliers' impacts and aspects, goals and measurement systems, audit programs and follow-up mechanisms, training, and management support. This standard is applied and performance gaps are handled in the same manner as the quality related issues. Continuous improvement of performance is the goal of A-BI's interaction with its suppliers. All purchasing reviewers have been trained on A-BI's EHS Management System and the proper application of the environmental standard. This program is being expanded to other suppliers as appropriate.

A-B corporate has selected strategic suppliers who it will work more closely with on reducing costs through environmental improvement. Management systems will be discussed in detail with these specific suppliers.

Historically, A-B has worked closely with many suppliers on various environmental issues. Examples include packaging and recycling, sustainable forestry practices, and lower volatile organic compound (VOC) paints, coatings, and solvents.

Performance Tracking

Annually, an aspects analysis is performed to establish significant aspects. EHS regulations are used daily to modify aspects as appropriate. Strategic plans with targets and objectives are established based upon previous years of performance. Metric data is analyzed at least monthly by the plant, subsidiaries and the corporate level. Deployment steps are modified or augmented if metrics are not being achieved. Metrics are used for awarding merit increases, bonuses and stock options.

Environmental measurement practices that are attributed to the EMS include daily monitoring of department wastewater flow, biologic oxygen demand (BOD) and total suspended solids (TSS) and quarterly monitoring of certain hazardous wastes.

Audit and Review

A-BI established its environmental audit program in 1981. Currently, teams of corporate environmental staff, on-site environmental staff, and external consultants conduct audits at each facility. Subsidiary and corporate staff groups are also audited. The company has established Facility Environmental Liaisons. These are corporate representatives who can

be advocates for specific facilities. A facility compliance self-assessment program has also been implemented.

The frequency of facility audits is based on risk. Previous audit results, the number of fines and penalties incurred, and the existence of sensitive issues are all factors that influence the audit schedule. Facilities are typically audited every two to five years.

The compliance self-assessment program is to identify potential and actual non-conformances with laws and internal requirements. Additionally, each facility is provided and maintains an on-line EHS manual which is designed to provide the facility with all the tools necessary to maintain compliance with laws and internal requirements.

Regardless of how a non-compliance with a regulation or internal requirement is discovered, a corporate procedure has been developed to address, mitigate, and quickly correct the nonconformance. The procedure consists of two main programs. The Environmental Issues Status Report is used to address and track the timely correction of the nonconformance with the law or internal requirements. A Root Cause Analysis is used to mitigate recurring nonconformance with the law or internal requirement.

Environmental Performance Indicators

The actual environmental performance of the pilot during the study period is discussed below.

Progress Towards Objective and Targets, Table 2

Table 2 lists objectives and targets for A-BI as well as the status and whether the target was regulated or non-regulated. It is important to note that the targets are not specific to the Fairfield Brewery, but rather corporate-wide for all of A-BI's breweries.

During the reporting period, it does not appear that A-BI's Fairfield facility met the corporate targets indicated in Table 2. It is important to mention that during the late 80's and early 90's, the company focused on compliance only. In the mid- to late-90's, the company focused on employee awareness.

To make progress in meeting its targets, A-BI currently employs an index which considers electricity, fuel, water, chemical usage, biologic oxygen demand (BOD), total suspended solids (TSS), solid waste, chemical count, and purchased carbon dioxide (CO₂). A-BI targets an annual 1% reduction in each of these on a corporate-wide basis.

Pre and Post EMS Environmental Performance, Table 3

Table 3 lists environmental performance indicators for the baseline years 1990, 1991, and 1992 and pre-certification years 1993-2000. This data was collected using the University of North Carolina database. This table shows increases and decreases in various indicators. These fluctuations are due in part because the Fairfield facility brews specialty beers so the

process changes, requiring cleaning and changes in product production. The following provides further explanation about the fluctuation in the indicators where A-BI had information available.

1. Wastewater Discharged-Flow: The normalized numbers do not fluctuate a great deal. The numbers tend to support a general decrease since 1996. Behavior modification played a big role in reducing water use and the resulting wastewater flow. Employees were educated on what their roles and responsibilities were and what impacts their actions could have on wastewater flow.
2. Sewer BOD: The normalized numbers fluctuate slightly up and down during the reporting period due to different product mixes. Specialty beers have a higher BOD. It is not possible to discern a trend from the reported data.
3. Purchased Carbon Dioxide: The data clearly show an increase in the use of carbon dioxide since 1997. As carbon dioxide is used for cooling, its increased use was coincident with a decrease in the use of ammonia.
4. TRI Releases, Ammonia, Solid Waste, Hazardous and Sewer TSS: Because the data goes back to the early 90's, the facility is not able to say specifically why these numbers fluctuate. However, the increase in ammonia use generally corresponds with major equipment changes and the need for pump out (i.e. cleaning). Ammonia use decreases as these equipment change-outs lessen and ammonia in general is controlled by operator attention and timely maintenance.
5. Hazardous Waste Increases: Increases are often the result of periodic cleanouts (i.e. cooling tower pumps, boiler - mud drums, etc) where the facility can get a large quantity of metal contaminated wastes.
6. TSS Increases: Increases are often associated with equipment issues, grain or slurry which is too wet because of equipment problems.
7. Purchased Fuel: Table 3 does not indicate a substantial change in fuel purchases over the past ten years. But, the data do show a general increase in fuel usage in the late 1990's, as compared to the early 1990's. The increases are due to the increasing role that the Fairfield facility played with brewing specialty products.
8. Purchased Electricity: Table 3 shows no meaningful change in purchased electricity.

Performance beyond Regulatory Requirements, Table 4

This table is designed to show how the facility performs against their permitted emissions. Because this facility has many permitted sources, the emissions are shown in aggregate. A-BI did perform within regulatory requirements during the pilot project (see compliance information in next table).

Compliance Performance, Table 5

Table 5 provides compliance information for the period 1990 through 1994. During this period, A-BI did not experience any regulatory non-compliance. In 1997 and 1998, there was a discharge with a Ph reading that resulted in a notice from the Fairfield-Suisun Sewer District.

4.2 Objective 2 Environmental Information

Public and Stakeholder Involvement in EMS Development, Implementation and Review

Cal/EPA established stakeholder Working Groups in both Southern and Northern California. Participation in one of those working groups was a requirement of inclusion into the pilot project. Working Groups were established to enlist stakeholder involvement and advice in meeting the objectives of the Cal/EPA pilot project as well as to provide a forum for stakeholder input into the pilot's EMS. Although pilot project participation with stakeholders through the Working Group was a project requirement, the experience of A-BI in this setting can provide information as to the willingness of parties to work together as well as the value of that relationship. A-BI participated on the Northern California Working Group and hosted an on-site meeting and facility tour in 1999 and on May 24, 2001.

It is important to remember that A-BI has had environmental management system elements in place for many years and that its efforts to achieve certification to the ISO 14001 standard represented one more step in its EMS efforts. The Fairfield facility was certified to ISO 14001 in December 1999 and so was closely aligned with the standard when discussions of their participation began. There was not public involvement in the EMS development, implementation and review. However, the facility did participate as an active member of the pilot project, completing the protocols, attending Working Group meetings, and hosting two on-site meetings and tours.

Improvements in Accessibility and Quality of Environmental Information, Table 6

Table 6 identifies what environmental information is available and where to look for that information. Much of the information provided by A-BI is given in corporate-wide terms and not by the individual facility.

The information that is provided by A-BI can be found on its web-site, in company newsletters, annual reports, and through its public relations department. Developing an EMS has helped move the company to more substantial reporting of information and data. In the early 1990's, the company rarely communicated anything except general public relations type information. The company now communicates as much as possible and explains its performance, both good and bad.

4.3 Objective 3 Economic Incentives and Barriers to EMS Implementation

Economic indicators were not available from the pilot project; therefore, an analysis of economic costs and benefits of EMS implementation is not included.

A-BI states that the implementation of the EMS led to decreases in energy costs, water and wastewater expenses, carbon dioxide costs, landfill dumping and transportation fees, hazardous waste disposal fees, and ammonia purchases. In addition, A-BI reports decreases in insurance costs and environmental liability and workers compensation costs.

4.4 Objective 4 Successes and Challenges of EMS Implementation

When A-BI choose to establish its formal EMS and receive ISO 14001 certification, it was convinced that through its historical EHS program, it already had the basic elements in place. By virtue of the efficiency through which A-BI applied and received its certification, their expectation proved to be true. However, perhaps because of its established history as an environmental leader, A-BI did not see quantitative results that showed significant environmental improvements that coincided with its ISO 14001 EMS. This may impact A-BI's decisions to implement such systems at its other facilities. Rather, they may conclude that the EHS programs are producing the results to maintain its environmental leadership position.

4.5 Objective 5 Determine if and how A-BI uses progress towards targets to continually reduce adverse environmental impacts

A-BI's approach to continual improvement relies on the "plan-do-check-act" process. Data is collected and analyzed, root cause failure analysis is performed, targets and objectives are created and deployment steps are developed.

While A-BI did have specific targets for several of its objectives (e.g., reduce water discharges by 10% per year), the data does not support that such quantitative goals were achieved. More recently, A-BI has used a composite score for its objectives with the goal of reducing the score by 1% per year.

A-BI is also in a process of continual improvement of its system for environmental protection. As part of its operation, continual improvement occurs through periodic refresher training, awareness communication efforts, refinement of procedures and continued evaluation of less hazardous chemicals. During various visits to the facility, it has been reported that the Fairfield facility is the lowest water user and wastewater discharger within A-BI's 12 breweries. It is also noted that this facility has achieved over a 98% recycle rate of its wastes and by products.

4.6 Objective 6 Determine the impact on A-BI's EMS on increasing the awareness and implementation of pollution prevention measures

A-BI believes that its EMS has increased awareness and promoted the implementation of pollution prevention measures. During and after the implementation of A-BI's EHS Management System, the company moved pollution prevention from a reactive to a proactive strategy. Pollution prevention is centered on reduction and reuse, and has been

expanded to utility companies providing service to the brewery. Prior to their EHS management system, A-BI focused its pollution prevention activities on compliance and product and byproduct recovery.

4.7 Objective 7 Determine if EMS Leads to a Reduction in Violations/Potential Violations

The Cal/EPA Project Manager was unable to determine if A-BI's EMS led to a reduction in violations or potential violations at the Fairfield facility because A-BI already had a successful compliance history. During the reporting period, this facility had only two reported non-compliances and no fines associated with these actions. A-BI has reported that some of their facilities in other states have experienced large fines for violations. Using methods from the Fairfield facility, these nonconforming facilities are now improving their compliance record.

4.8 Objective 8 Determine if A-BI's EMS leads to greater employee awareness of their individual impact on the environment, as well as the likelihood that they will make adjustments to reduce their impacts

A-BI conducted environmental training at all operating facilities for all levels of employees prior to implementation of its Management System. After implementation, employees better understood their roles and responsibilities. Employees also appear to better understand that they are empowered and have the authority to perform their jobs in the most EHS-friendly way. Anheuser-Busch's EHS Policy states "neither production goals nor financial objectives shall excuse noncompliance with the EHS Policy."

5.0 Findings

Implementing an ISO 14001 EMS did not significantly impact the way A-BI does business. A-BI has had an environmental management system which included a continuous improvement process in one form or another for many years. One of their reasons for pursuing registration to ISO 14001 at their Fairfield facility was to test its belief that they could be certified to the ISO 14001 standard with modest adjustments to their EHS. The brewery in Fairfield is the only facility that has been certified to the ISO 14001 standard. At this time, there are no plans for other breweries to be certified because ISO 14001 elements have been incorporated into the corporate EHS Management System.

The registration process did provide a better process to prioritize A-BI's environmental aspects and impacts and improved their environmental policy by more explicitly stating its environmental commitments to its employees, communities, contractors, suppliers, customers and stakeholders.

5.1 Objective 1 Environmental Protection

- As a result of creating an Environmental Policy, A-BI more explicitly states its environmental commitments to its employees, communities, contractors, suppliers,

customers and stakeholders. Although A-BI has a history of environmental protection, their commitment to environmental protection has not previously been communicated so clearly and completely.

- Implementing an EMS did not significantly impact A-BI's knowledge and understanding of legal requirements. A-BI incorporated already existing compliance programs into their EMS with only minor modifications.
- As a result of evolving their EMS to meet the ISO 14001 registration requirements, A-BI realized the following improvements and benefits.
 - Facility line management take increased ownership of the system
 - Employees take pride in their accomplishments and recognition
 - Standard operating procedures are reinforced
 - EHS performance is improved
 - Operators are more aware of their responsibilities to the environment
 - Programs are standardized
 - Facility has a tool for self-assessment

5.2 Objective 2 Environmental Information

- A-BI provides the public with corporate-wide information about its facilities through its web-site, newsletters, annual report, and its public relations department. Developing an EMS has helped move the company to more substantial reporting of information and data. In the early 1990s, the company rarely communicated anything except general public relations type information. The company now communicates as much as possible and explains its performance, both good and bad
- A-BI believes that public reporting gives the company more credibility with all of its stakeholders (internal and external). A direct result of A-BI's EMS was its participation as a pilot project participant. As part of its participation, A-BI hosted Working Group meetings as well as provided facility tours to representatives from industry, government and the environmental community. These activities have helped to improve the information that is available to these specific members of the public. However, facility-specific information on the Fairfield Brewery's environmental impacts is not readily available to the public

5.3 Objective 3 Economic Incentives and Barriers to EMS Implementation

A-BI did not provide economic data related to the implementation of their EMS. However, they have stated that the implementation of the EMS led to decreases in energy costs, water and wastewater expenses, carbon dioxide costs, landfill dumping and transportation fees, hazardous waste disposal fees, and ammonia purchases. In addition, according to A-

BI representatives there have been decreases in insurance costs and environmental liability and workers compensation costs.

5.4 Objective 4 Successes and Challenges of EMS Implementation

- Because many of the key A-BI participants were located in its headquarters in St. Louis, Missouri, obtaining Fairfield-specific data presented challenges
- When A-BI choose to establish its formal EMS and receive ISO 14001 certification, it was convinced that through its historical EHS program, it already had the basic elements in place. By virtue of the efficiency through which A-BI applied and received its certification, their expectation proved to be true. However, perhaps because of its established history as an environmental leader, A-BI did not see quantitative results that showed significant environmental improvements that coincided with its ISO 14001 EMS. This may impact A-BI's decisions to implement such systems at its other facilities. Rather, they may conclude that the EHS programs are producing the results to maintain its environmental leadership position.

5.5 Objective 5 Determine if and how A-BI uses progress towards targets to continually reduce adverse environmental impacts

Increased awareness and the continual improvement process has resulted in the A-BI Fairfield brewery being the lowest water user and wastewater discharger within A-BI's 12 breweries. Another notable environmental performance improvement is achieving over a 98% recycle rate of its wastes and by products. A-BI has also won 6 Waste Reduction Award Program (WRAP) awards from the California Integrated Waste Management Board.

5.6 Objective 6 Determine the impact on A-BI's EMS on increasing the awareness and implementation of pollution prevention measures

- System role model status for wastewater flow, BOD and TSS, and system role model status for water usage
- Daily monitoring of department wastewater flow, BOD and TSS, and quarterly monitoring of certain hazardous wastes

5.7 Objective 7 Determine if EMS Leads to a Reduction in Violations/Potential Violations

The Cal/EPA Project Manager was unable to determine if A-BI's EMS led to a reduction in violations or potential violations at the Fairfield facility because A-BI already had a successful compliance history.

5.8 Objective 8 Determine if A-BI's EMS leads to greater employee awareness of their individual impact on the environment, as well as the likelihood that they will make adjustments to reduce their impacts

- For A-BI, the training program that evolved because of their ISO 14001 certification is a real success
- Training to increase workers awareness of how their behavior impacts the environment appears to be of significant importance in improving the facility's environmental effect. After training, A-BI employees have a better understanding of the EHS consequences of not performing their job correctly. Employees also understand they are empowered and have the authority to perform their jobs in the most EHS-friendly way

6.0 Conclusions of the A-BI Pilot Project

Because A-BI has such a long history of being an environmental steward and was close to ISO 14001 certification when it became a pilot project, we did not see dramatic changes in its environmental performance. By virtue of formalizing its EMS, two key benefits were realized:

1. Increased employee awareness of the impact of day-to-day activities on the environment
2. Improved documentation and maintenance of up-to-date operating procedures

These impacts suggest that A-BI's EMS will help to reduce the occurrence of potential problems as well as respond more effectively when problems occur.

Though A-BI has identified a number of areas where it believes its EMS has resulted in environmental improvements, it is challenging to use the protocol data to support this conclusion. Specifically, the Project Manager is persuaded that A-BI is an environmental leader by virtue of the numerous environmental programs it has implemented, the priority that management and staff place on environmental protection, and its long history of innovation as well as its compliance history. Further, there is concurrence by multiple regulatory agencies as well as others that A-BI has an excellent environmental record. However, attributing specific measures or improvements to the EMS does appear to be supported. That is because there is not a clear line where A-BI began EMS-related activities, but rather a continuum of adjustments and improvements for well over a decade. As such, we did not observe many substantial changes in performance indicators over the study period. An exception is the TRI releases which have shown a substantial decrease over the past few years. However, several of the performance measures do not appear to have meaningfully changed over the past few years while some actually increased due to site-specific factors (e.g., fuel usage). In summary, we cannot point to changes in performance measures (Table 3) and confidently relate them to the establishment of the EMS. However, A-BI's belief that its EMS has strengthened its ability to continue its record of environmental leadership is noted.

Table 1. Significant Aspects and Impacts for A-BI

Aspect	Regulated Impacts				Non-Regulated Impacts					
	Air	Water	Haz. Material or Waste	Health & Safety (other)	Air	Water	Solid Waste	Energy	Material/ Resource Input	Other
Ammonia Refrigeration	X			X		X	X	X	X	Natural Resource*
Boiler Operation	X					X	X	X	X	"
Mash & Cooker Operations	X					X	X	X	X	"
Brew Kettle Operations	X					X	X	X	X	"
Bottle Lines (Return)	X			X		X	X	X	X	"

*"Natural Resource" means water (drinking water, irrigation water, and process water), electricity and fuel.

Table 2. Objectives and Targets for A-BI

Objective	Target *	Status (Reporting Period 1990-94)	Regulated		Non-Regulated
			Meets	Beyond	
Reduce Energy	Reduce per unit utility usage by 10%/yr. (corporate-wide)	During the reporting period it does not appear that this facility met this target. See footnote for current status.			X
	Increase employee awareness of utility costs	Developed SOPs in early 90's; mid-90's initiated employee awareness programs (i.e. newsletters, AB TV, suggestion box, rewards)			X
Reduce Water Use	Reduce water discharges by 10%/yr. (corporate-wide)	During the reporting period it does not appear that this facility met this target. See footnote for current status.			X
Reduce Solid Waste Disposal	Improve waste segregation by 15%/yr. (corporate-wide)	During the reporting period it does not appear that this facility met this target. See footnote for current status.			X
	Better waste-handling procedures	Developed SOPs & employee training			X
	Increase employee awareness	Develop SOPs in early 90's; mid-90's to 1999 initiated employee awareness programs (i.e., newsletters, AB TV, suggestion box, rewards)			X
	Maximize use of renewable resources	See footnote			X
Reduce Hazardous Waste Disposal	Substitute nonhazardous parts-washing fluid for hazardous fluid by 15%/yr	Deployment step to achieve 15% on Target "Improve Waste Segregation"			X

- To make progress in meeting its targets, A-BI currently employs an index which includes electricity, fuel, water, chemical usage, BOD, TSS, solid waste, chemical count, and purchased CO2 and an annual 1% reduction corporate-wide

Table 3. Pilot Project Environmental Performance Measures for A-BI

Indicator	Baseline Data			Update Data							
	Normalized 1990	Normalized 1991	Normalized 1992	Normalized 1993	Normalized 1994	Normalized 1995	Normalized 1996	Normalized 1997	Normalized 1998	Normalized 1999	Normalized 2000
Wastewater Discharged- Flow	4.28 BBLs per BBL packaged	3.91 BBLs per BBL packaged	3.43 BBLs per BBL packaged	3.57 BBLs per BBL packaged	3.26 BBLs per BBL packaged	3.58 BBLs per BBL packaged	4.28 BBLs per BBL packaged	4.11 BBLs per BBL packaged	4.21 BBLs per BBL packaged	3.93 BBLs per BBL packaged	3.60 BBLs per BBL packaged
Sewer -BOD	1.46 BBL per BBL packaged	1.63 LBS per BBL packaged	1.51 LBS per BBL packaged	1.48 LBS per BBL packaged	1.43 LBS per BBL packaged	1.60 LBS per BBL packaged	1.46 LBS per BBL packaged	1.67 LBS per BBL packaged	1.70 LBS per BBL packaged	1.33 LBS per BBL packaged	1.23 LBS per BBL packaged
Purchased Carbon Dioxide	1.24 LBS per BBL packaged	.85 LBS per BBL packaged	1.31 LBS Per BBL packaged	1.25 LBS per BBL packaged	0.79 LBS per BBL packaged	1.48 LBS per BBL packaged	1.24 LBS per BBL packaged	1.78 LBS per BBL packaged	2.36 LBS per BBL packaged	2.98 LBS per BBL packaged	3.44 LBS per BBL packaged
Toxic Releases & Transfer	12.38 LBS Per BBL packaged	22.81 LBS per BBL packaged	9.98 LBS per BBL packaged	12.10 LBS per BBL packaged	13.44 LBS per BBL packaged	13.91 LBS per BBL packaged	12.38 LBS per BBL packaged	9.77 LBS per BBL packaged	6.85 LBS per BBL packaged	4.35 LBS per BBL packaged	
TRI - Ammonia	12.38 LBS per BBL packaged	22.81 LBS per BBL packaged	9.98 LBS per BBL packaged	12.10 LBS per BBL packaged	13.44 LBS per BBL packaged	13.91 LBS per BBL packaged	12.38 LBS per BBL packaged	9.77 LBS per BBL packaged	6.85 LBS per BBL packaged	6.71 LBS per BBL packaged	
Solid Waste Landfilled	894 LBS per MBBL packaged	1471 LBS per MBBL packaged	1283 LBS per MBBL packaged	1378 LBS per MBBL packaged	1079 LBS per MBBL packaged	914 LBS per MBBL packaged	894 LBS per MBBL packaged	923 LBS per MBBL packaged	944 LBS per MBBL packaged	882 LBS per MBBL packaged	736 LBS per MBBL packaged
RCRA Hazardous Waste Generated	1.38 LBS per MBBL packaged	2.92 LBS per MBBL packaged	2.17 LBS per MBBL packaged	2.19 LBS per MBBL packaged	1.14 LBS per MBBL packaged	2.92 LBS per MBBL packaged	1.38 LBS per MBBL packaged	2.92 LBS per MBBL packaged	1.42 LBS per MBBL packaged	1.02 LBS per MBBL packaged	4.83 LBS per MBBL packaged
Sewer - TSS	0.46 LBS per BBL packaged	0.49 LBS per BBL packaged	0.63 LBS per BBL packaged	0.49 LBS per BBL packaged	0.61 LBS per BBL packaged	0.48 LBS per BBL packaged	0.46 LBS per BBL packaged	0.46 LBS per BBL packaged	0.50 LBS per BBL packaged	0.38 LBS per BBL packaged	0.43 LBS per BBL packaged
Purchased Fuel	219.20 MBTU per BBL packaged	217.00 MBTU per BBL packaged	206.20 MBTU per BBL packaged	212.70 MBTU per BBL packaged	203.80 MBTU per BBL packaged	221.00 MBTU per BBL packaged	219.20 MBTU per BBL packaged	233.90 MBTU per BBL packaged	246.00 MBTU per BBL packaged	245.80 MBTU per BBL packaged	230.80 MBTU per BBL packaged
Process Loss		8.10 LBS per MBBL packaged	7.20 LBS per MBBL packaged	9.00 LBS per MBBL packaged	9.50 LBS per MBBL packaged	8.50 LBS per MBBL packaged	8.10 LBS per MBBL packaged	8.50 LBS per MBBL packaged	7.30 LBS per MBBL packaged	6.90 LBS per MBBL packaged	
Purchased Electricity	15.47 KWH per BBL packaged	15.74 KWH per BBL packaged	15.56 KWH per BBL packaged	15.69 KWH per BBL packaged	16.10 KWH per BBL packaged	15.81 KWH per BBL packaged	15.47 KWH per BBL packaged	16.55 KWH per BBL packaged	16.68 KWH per BBL packaged	16.42 KWH per BBL packaged	15.58 KWH per BBL packaged

Table 4. Environmental Performance Compared to Regulatory Requirements for A-BI

Regulatory Requirement			Objective and Target	Environmental Performance Measure				
Permitted Emission	Regulation	Permit limit		1990	1991	1992	1993	1994
CO (Boilers)				116.8	116.43	119.07		
NO _x				19.08	15.16	15.47		
PM				2.42	1.98	2.03		
PM10				2.42	1.98	2.03		
VOC								
SO ₂				4.23	0.27	4.23		
PM(silos, milling/wgt, grain unloading filter/receiver)				1.93	2.04	2.18		
PM10				0.79	0.83	0.89		
NH3(Refirg.)				117.6	.32.52	8.29		
VOC(Mash cookers,workarators, alcool storage,fermentatio tanks etc.)				23.10	23.88	25.44		

The air emissions presented is for an aggregation of emission sources rather than for each permitted unit. For example, emissions of PM and PM10 under the category "silos, milling/weighting, grain unloading filter/receiver, etc." represent the total emissions of PM and PM10 from theses types of activities.

Federal, State and local air requirements are embedded in the local air district permits. In California, emission limits are typically established for each individual permitted unit. The limits may be based on a number of variables that include fuel use, hours of operation, VOC content of feedstocks, and concentration of sulfur in the fuel.

Table 5. Compliance Information for A-BI

Infraction	Historic	Baseline			Update	
		Year 1990	Year 1991	Year 1992	Year 1993	Year 1994
Major Violation		0	0	0	0	0
Significant (Minor) Violation		0	0	0	0	0
Minor Violation		0	0	0	0	0
Non-Compliance		0	0	0	0	0
Potential Non-Compliance		0	0	0	0	0

Note: Most EPA enforcement policies explicitly utilize "Major, significant (moderate) and minor" classifications to determine the appropriate enforcement response to a given violation. A Noncompliance is an infraction either discovered by the regulated party or environmental agency that does not lead to a violation. A Potential Noncompliance is a situation that is discovered and corrected before a violation could occur.

Table 6. Environmental Information Type and Availability to Public

Infraction	Historic	Baseline			Update	
		Year 1990	Year 1991	Year 1992	Year 1993	Year 1994
Major Violation		0	0	0	0	0
Significant (Minor) Violation		0	0	0	0	0
Minor Violation		0	0	0	0	0
Non-Compliance		0	0	0	0	0
Potential Non-Compliance		0	0	0	0	0

Note: For Legal Reporting Requirement, mark NA if not applicable